AMENDMENTS TO THE CLAIMS

Please amend the claims as set forth hereinbelow.

1. **(cancelled)**

2. **(cancelled)**

3. **(previously presented)**
A fiber-ring optical resonator, comprising:
a. a resonator fiber; and
b. a transverse fiber-ring resonator segment integral with the resonator fiber, the resonator segment having a circumferential optical path length different from the circumferential optical path length of the resonator fiber adjacent to the resonator segment so that the resonator segment may support a substantially circumferential resonant optical mode near an outer surface of the resonator fiber segment,
wherein the fiber-ring resonator segment is formed by removal of material from the resonator fiber by cylindrical processing of the resonator fiber.

4. **(cancelled)**

5. **(previously presented)**
A fiber-ring optical resonator, comprising:
a. a resonator fiber;
b. a transverse fiber-ring resonator segment integral with the resonator fiber, the resonator segment having a circumferential optical path length different from the circumferential optical path length of the resonator fiber adjacent to the resonator segment so that the resonator segment may support a substantially circumferential resonant optical mode near an outer surface of the resonator fiber segment; and
a second optical element, the second optical element and the resonator segment being arranged so as to permit evanescent optical coupling between the circumferential resonant optical mode of the resonator segment and an optical mode of the second optical element,

wherein the fiber-ring resonator segment is formed by cylindrical processing of the resonator fiber.

6. **(previously presented)**
A fiber-ring optical resonator, comprising:
a. a resonator fiber; and
b. a transverse fiber-ring resonator segment integral with the resonator fiber, the resonator segment having a circumferential optical path length different from the circumferential optical path length of the resonator fiber adjacent to the resonator segment so that the resonator segment may support a substantially circumferential resonant optical mode near an outer surface of the resonator fiber segment,

wherein the resonator fiber includes a delocalized-optical-mode suppressor.

7. **(original)** The fiber-ring optical resonator of Claim 6, wherein the mode suppressor includes a hermetic carbon coating element.

8. **(original)** A fiber-ring optical resonator assembly comprising:
a. a resonator fiber;
b. a transverse resonator segment formed on the resonator fiber, the transverse resonator fiber segment forming a fiber-ring resonator;
c. the resonator segment located on the resonator fiber between a first and a second segment of the resonator fiber;
d. a delocalized-optical-mode suppressor including a hermetic carbon coating element on at least one of the first and second segments of the resonator fiber;
e. a transmission fiber optic waveguide, the waveguide having a fiber-optic-taper segment; and
f. a taper positioner, the taper positioner arranged for engaging the taper segment of the transmission waveguide in proximity to the fiber-ring resonator so as to enable evanescent optical coupling of the transmission waveguide and the fiber-ring resonator.

9. **(original)** The fiber-ring optical resonator assembly of Claim 8, wherein the taper positioner is further adapted to position the fiber-optic taper segment longitudinally displaced from a longitudinal midpoint of the fiber-ring resonator, thereby substantially reducing undesirable taper-induced optical loss in the fiber ring resonator.

10. **(original)** The fiber-ring optical resonator assembly of Claim 8, wherein the resonator fiber has a plurality of resonator fiber segments formed thereon and at least two of the resonator fiber segments are arranged so as to permit evanescent optical coupling therebetween.

11. **(currently amended)** A method for altering transmission of an optical signal through a transmission optical waveguide, comprising the step of ~~evanescently optically coupling~~ assembling the transmission optical waveguide with a fiber-ring resonator assembly ~~to a transmission optical waveguide,~~ so as to establish evanescent optical coupling therebetween, thereby altering transmission of an optical signal through the transmission optical waveguide if the optical signal is substantially resonant with the fiber-ring resonator assembly, the fiber-ring resonator assembly including:
    a. a resonator fiber; and
    b. a transverse fiber-ring resonator segment integral with the resonator fiber, the resonator segment having a circumferential optical path length different from the circumferential optical path length of the resonator fiber adjacent to the resonator segment so that the resonator segment may support a substantially circumferential resonant optical mode near an outer surface of the resonator fiber segment.

12. **(original)** A method for altering transmission of an optical signal through a transmission optical waveguide, comprising the steps of:
    a. evanescently optically coupling a fiber-ring resonator to a transmission fiber-optic waveguide having a fiber-optic taper segment for evanescent optical coupling to the fiber-ring resonator;

b. modulating a coupling condition between the transmission optical waveguide and the fiber-ring resonator, the coupling condition being varied from an over-coupled condition between the transmission optical waveguide and the fiber-ring resonator and a critically-coupled condition between the transmission optical waveguide and fiber-ring resonator.

13. **(original)** The method of Claim 12 wherein the coupling-condition modulating step includes the step of modulating round-trip optical loss of the fiber-ring resonator assembly.

14. **(original)** The method of Claim 12 further including the step of evanescently optically coupling a second transmission optical waveguide to the fiber-ring resonator assembly, thereby enabling transfer of the optical signal between the first transmission fiber optic waveguide and the second transmission fiber optic waveguide when the optical signal is substantially resonant with the fiber-ring resonator optical mode.

15. **(previously presented)** The method of Claim 12 wherein the fiber-ring resonator includes a plurality of fiber optic ring resonator segments, at least two of such segments being evanescently optically coupled therebetween, and wherein the refractive index of at least one of the fiber-ring segments has been modified by a processing beam.

16. **(cancelled)**

17. **(cancelled)**

18. **(previously presented)** A fiber-ring optical resonator, comprising:
a silica-based resonator optical fiber; and
a silica-based transverse fiber-ring optical resonator segment integral with the resonator optical fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one immediately adjacent segment of the resonator optical fiber so as

to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment.

19. **(cancelled)**

20. **(previously presented)** A fiber-ring optical resonator, comprising:
a resonator optical fiber; and
a transverse fiber-ring optical resonator segment integral with the resonator optical fiber and formed by spatially-selectively removing material from the resonator fiber, the resonator segment thereby having a diameter sufficiently larger than the diameter of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment.

21. **(cancelled)**

22. **(previously presented)** A fiber-ring optical resonator, comprising:
a silica-based resonator optical fiber; and
a transverse fiber-ring optical resonator segment formed by spatially-selectively depositing silica-based optical material onto the resonator fiber, the resonator segment thereby having a diameter sufficiently larger than the diameter of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment.

23. **(cancelled)**

24. **(previously presented)** A fiber-ring optical resonator, comprising:
a resonator optical fiber; and
a transverse fiber-ring optical resonator segment integral with the resonator optical fiber and formed by spatially-selective densification of the resonator optical fiber, the resonator segment thereby having a refractive index sufficiently larger than a refractive index of at least one immediately adjacent segment of

the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment.

25. **(previously presented)** A fiber-ring optical resonator, comprising:
a resonator optical fiber; and
a transverse fiber-ring optical resonator segment integral with the resonator optical fiber and formed by spatially-selective UV-irradiation of the resonator optical fiber, the resonator segment thereby having a refractive index sufficiently larger than a refractive index of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment.

26. **(previously presented)** A fiber-ring optical resonator, comprising:
a resonator optical fiber; and
a transverse fiber-ring optical resonator segment integral with the resonator optical fiber and formed by spatially-selectively doping of the resonator optical fiber, the resonator segment thereby having a refractive index sufficiently larger than a refractive index of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment.

27. **(previously presented)** A fiber-ring optical resonator, comprising:
a resonator optical fiber;
a transverse fiber-ring optical resonator segment integral with the resonator optical fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and
a delocalized-optical-mode suppressor provided on the resonator optical fiber.

28. **(previously presented)** A fiber-ring optical resonator, comprising:

a resonator optical fiber;

a transverse fiber-ring optical resonator segment integral with the resonator optical fiber between first and second segments of the resonator fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and

a scattering element provided on at least a portion of at least one of the first and second segments of the resonator fiber for suppressing delocalized optical modes.

29. **(previously presented)** A fiber-ring optical resonator, comprising:

a resonator optical fiber;

a transverse fiber-ring optical resonator segment integral with the resonator optical fiber between first and second segments of the resonator fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and

a coating provided on at least a portion of at least one of the first and second segments of the resonator fiber for suppressing delocalized optical modes.

30. **(previously presented)** A fiber-ring optical resonator, comprising:

a resonator optical fiber;

a transverse fiber-ring optical resonator segment integral with the resonator optical fiber between first and second segments of the resonator fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as

to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and

a hermetic carbon coating provided on at least a portion of at least one of the first and second segments of the resonator fiber for suppressing delocalized optical modes.

31. **(previously presented)** A fiber-ring optical resonator, comprising:

a hollow-core resonator optical fiber; and

a transverse fiber-ring optical resonator segment integral with the resonator optical fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment,

the hollow core of the resonator fiber serving as a delocalized-optical-mode suppressor.

32. **(previously presented)** A fiber-ring optical resonator, comprising:

a resonator optical fiber having an optically lossy core; and

a transverse fiber-ring optical resonator segment integral with the resonator optical fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment,

the optically lossy core of the resonator fiber serving as a delocalized-optical-mode suppressor.

33. **(previously presented)** A fiber-ring optical resonator, comprising:

a resonator optical fiber;

a transverse fiber-ring optical resonator segment integral with the resonator optical fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one

immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and

a taper-positioning-and-support structure provided on the resonator fiber and adapted for engaging a fiber-optic-taper segment of a transmission fiber-optic waveguide in proximity to the resonator segment, thereby enabling evanescent optical coupling of the fiber-ring optical resonator and the transmission fiber-optic waveguide.

34. **(previously presented)** A fiber-ring optical resonator, comprising:

a resonator optical fiber;

a transverse fiber-ring optical resonator segment integral with the resonator optical fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and

a taper-positioning-and-support structure provided on the resonator fiber and adapted for engaging a fiber-optic-taper segment of a transmission fiber-optic waveguide in proximity to the resonator segment and axially displaced from an axial midpoint of the resonator segment, thereby enabling evanescent optical coupling of the transmission fiber-optic waveguide and the fiber-ring optical resonator and reducing undesirable fiber-optic-taper-induced optical loss of the fiber-ring optical resonator.

35. **(previously presented)**A fiber-ring optical resonator, comprising:

a resonator optical fiber;

a transverse fiber-ring optical resonator segment integral with the resonator optical fiber, the resonator segment having a diameter sufficiently larger than the diameter of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and

a radially-extending radially-tapered transverse flange positioned on the adjacent segment of the resonator fiber near an edge of the resonator segment and adapted so that a fiber-optic-taper segment of a transmission fiber-optic waveguide may rest on the flange and the edge of the resonator segment, thereby enabling evanescent optical coupling of the transmission fiber-optic waveguide and the fiber-ring optical resonator and reducing undesirable fiber-optic-taper-induced optical loss of the fiber-ring optical resonator.

36. **(previously presented)** A fiber-ring optical resonator, comprising:

a resonator optical fiber;

a transverse fiber-ring optical resonator segment integral with the resonator optical fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and

a taper-positioning-and-support structure provided on the resonator fiber and adapted for engaging a fiber-optic-taper segment of a transmission fiber-optic waveguide in proximity to the resonator segment and radially displaced from an outer circumference of the resonator segment, thereby enabling evanescent optical coupling of the transmission fiber-optic waveguide and the fiber-ring optical resonator and reducing undesirable fiber-optic-taper-induced optical loss of the fiber-ring optical resonator.

37. **(previously presented)** A fiber-ring optical resonator, comprising:

a resonator optical fiber;

a transverse fiber-ring optical resonator segment integral with the resonator optical fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and

paired axially-juxtaposed radially-extending radially-tapered transverse flanges positioned on an outer circumference of the resonator segment and adapted so that a fiber-optic-taper segment of a transmission fiber-optic waveguide may rest on the paired flanges, thereby enabling evanescent optical coupling of the transmission fiber-optic waveguide and the fiber-ring optical resonator and reducing undesirable fiber-optic-taper-induced optical loss of the fiber-ring optical resonator.

38. **(previously presented)** A fiber-ring optical resonator, comprising:

a resonator optical fiber;

a transverse fiber-ring optical resonator segment integral with the resonator optical fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and

a taper-positioning-and-support structure provided on the resonator fiber and adapted for

engaging a fiber-optic-taper segment of a transmission fiber-optic waveguide in proximity to the resonator segment, thereby enabling evanescent optical coupling of the fiber-ring optical resonator and the transmission fiber-optic waveguide, and

enabling partially-wrapped engagement of the fiber-optic-taper segment around the fiber-ring optical resonator near a portion of the outer circumference thereof.

39. **(previously presented)** A fiber-ring optical resonator, comprising:

a resonator optical fiber;

a transverse fiber-ring optical resonator segment integral with the resonator optical fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one immediately adjacent segment of the resonator optical fiber so as to enable

the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and

a taper-positioning-and-support structure provided on the resonator fiber and adapted for

engaging a fiber-optic-taper segment of a transmission fiber-optic waveguide in proximity to the resonator segment, thereby enabling evanescent optical coupling of the fiber-ring optical resonator and the transmission fiber-optic waveguide,

enabling partially-wrapped engagement of the fiber-optic-taper segment around the fiber-ring optical resonator near a portion of the outer circumference thereof, and

providing an elongated region of evanescent optical coupling between the fiber-ring optical resonator and the fiber-optic-taper segment.

40. **(previously presented)** A fiber-ring optical resonator, comprising:

a resonator optical fiber;

a transverse fiber-ring optical resonator segment integral with the resonator optical fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and

a taper-positioning-and-support structure provided on the resonator fiber and adapted for

engaging a fiber-optic-taper segment of a transmission fiber-optic waveguide in proximity to the resonator segment, thereby enabling evanescent optical coupling of the fiber-ring optical resonator and the transmission fiber-optic waveguide,

enabling partially-wrapped engagement of the fiber-optic-taper segment around the fiber-ring optical resonator near a portion of the outer circumference thereof, and

enabling length adjustment of a region of evanescent optical coupling between the fiber-ring optical resonator and the fiber-optic-taper segment.

41. **(previously presented)** A fiber-ring optical resonator, comprising:
a resonator optical fiber;
a transverse fiber-ring optical resonator segment integral with the resonator optical fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and
a taper-positioning-and-support structure provided on the resonator fiber and adapted for
engaging a fiber-optic-taper segment of a transmission fiber-optic waveguide in proximity to the resonator segment, thereby enabling evanescent optical coupling of the fiber-ring optical resonator and the transmission fiber-optic waveguide,
enabling partially-wrapped engagement of the fiber-optic-taper segment around the fiber-ring optical resonator near a portion of the outer circumference thereof, and
stabilizing evanescent optical coupling between the fiber-ring optical resonator and the fiber-optic-taper segment.

42. **(previously presented)** A fiber-ring optical resonator, comprising:
a resonator optical fiber;
a transverse fiber-ring optical resonator segment integral with the resonator optical fiber between first and second segments of the resonator fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and

a radially-extending transverse flange provided on at least one of the first and second segments of the resonator fiber and adapted to be received in a corresponding groove of an alignment member.

43. **(previously presented)** A fiber-ring optical resonator, comprising:

a resonator optical fiber;

a transverse fiber-ring optical resonator segment integral with the resonator optical fiber between first and second segments of the resonator fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and

a circumferential groove provided on at least one of the first and second segments of the resonator fiber and adapted for receiving a corresponding flange of an alignment member.

44. **(previously presented)** A fiber-ring optical resonator, comprising:

a resonator optical fiber;

a transverse fiber-ring optical resonator segment integral with the resonator optical fiber between first and second segments of the resonator fiber, the resonator segment having a circumferential optical path length sufficiently different from the circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and

a modulator provided on the resonator optical fiber for modulating optical loss of the fiber-ring optical resonator.

45. **(previously presented)** A coupled fiber-ring optical resonator assembly, comprising:

a resonator optical fiber; and

multiple transverse fiber-ring optical resonator segments integral with the resonator optical fiber,

the resonator segments each having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one corresponding immediately adjacent segment of the resonator optical fiber so as to enable each resonator segment to support at least one resonant optical mode near an outer circumferential surface of the respective resonator segment,

the multiple resonator segments being sufficiently closely spaced so as to be evanescently optically coupled, thereby forming a coupled optical resonator system.

46. **(previously presented)** A coupled fiber-ring optical resonator assembly, comprising:

a resonator optical fiber; and

multiple transverse fiber-ring optical resonator segments integral with the resonator optical fiber,

the resonator segments each having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one corresponding immediately adjacent segment of the resonator optical fiber so as to enable each resonator segment to support at least one resonant optical mode near an outer circumferential surface of the respective resonator segment,

the multiple resonator segments being sufficiently closely spaced so as to be evanescently optically coupled, thereby forming a coupled optical resonator system,

a spectral width of a resonance band of the coupled-optical-resonator system being smaller than an optical channel spacing of an optical WDM system.

47. **(previously presented)** A coupled fiber-ring optical resonator assembly, comprising:

a resonator optical fiber; and

multiple transverse fiber-ring optical resonator segments integral with the resonator optical fiber,

the resonator segments each having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one corresponding immediately adjacent segment of the resonator optical fiber so as to enable each resonator segment to support at least one resonant optical mode near an outer circumferential surface of the respective resonator segment,

the multiple resonator segments being sufficiently closely spaced so as to be evanescently optically coupled, thereby forming a coupled optical resonator system,

a spectral width of a resonance band of the coupled-optical-resonator system being substantially equal to an optical channel spacing of an optical WDM system.

48. **(previously presented)** A coupled fiber-ring optical resonator assembly, comprising:

a resonator optical fiber; and

multiple transverse fiber-ring optical resonator segments integral with the resonator optical fiber,

the resonator segments each having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one corresponding immediately adjacent segment of the resonator optical fiber so as to enable each resonator segment to support at least one resonant optical mode near an outer circumferential surface of the respective resonator segment,

the multiple resonator segments being sufficiently closely spaced so as to be evanescently optically coupled, thereby forming a coupled optical resonator system,

a spacing between spectrally-adjacent resonance bands of the coupled-optical-resonator system being greater than an optical channel spacing of an optical WDM system.

49. **(previously presented)** A coupled fiber-ring optical resonator assembly, comprising:
a resonator optical fiber; and
multiple transverse fiber-ring optical resonator segments integral with the resonator optical fiber,
the resonator segments each having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one corresponding immediately adjacent segment of the resonator optical fiber so as to enable each resonator segment to support at least one resonant optical mode near an outer circumferential surface of the respective resonator segment,
the multiple resonator segments being sufficiently closely spaced so as to be evanescently optically coupled, thereby forming a coupled optical resonator system,
spectrally-adjacent resonance bands of the coupled-optical-resonator system being spaced by about an integer times an optical channel spacing of an optical WDM system.

50. **(previously presented)** A coupled fiber-ring optical resonator assembly, comprising:
a resonator optical fiber; and
multiple transverse fiber-ring optical resonator segments integral with the resonator optical fiber,
the resonator segments each having a circumferential optical path length sufficiently different from the circumferential optical path length of at least one corresponding immediately adjacent segment of the resonator optical fiber so as to enable each resonator segment to support at least one resonant optical mode near an outer circumferential surface of the respective resonator segment,
the multiple resonator segments being sufficiently closely spaced so as to be evanescently optically coupled, thereby forming a coupled optical resonator system,

each of the plurality of resonator segments being resonant at a substantially common optical resonance frequency,

the multiple resonator segments being substantially uniformly longitudinally spaced on the resonator optical fiber.

51. **(currently amended)** A method for altering transmission of an optical signal through a transmission optical waveguide, comprising the step of ~~evanescently optically coupling~~ assembling the transmission optical waveguide with a fiber-ring optical resonator ~~to the transmission optical waveguide,~~ so as to establish evanescent optical coupling therebetween, thereby altering transmission of the optical signal through the transmission optical waveguide when the optical signal is substantially resonant with at least one resonant optical mode, the resonant optical mode being at least partially supported by the fiber-ring optical resonator, the fiber-ring optical resonator comprising a transverse resonator segment integral with a resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment.

52. **(previously presented)** A method for altering transmission of an optical signal through a transmission fiber-optic waveguide, comprising the step of evanescently optically coupling a fiber-ring optical resonator to the transmission fiber-optic waveguide at a fiber-optic taper segment thereof, thereby altering transmission of the optical signal through the transmission fiber-optic waveguide when the optical signal is substantially resonant with at least one resonant optical mode, the resonant optical mode being at least partially supported by the fiber-ring optical resonator, the fiber-ring optical resonator comprising a transverse resonator segment integral with a resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment.

53. **(previously presented)** A method for altering transmission of an optical signal through a transmission optical waveguide, comprising the steps of:

evanescently optically coupling a fiber-ring optical resonator to the transmission optical waveguide, thereby enabling alteration of a level of transmission of the optical signal through the transmission optical waveguide when the optical signal is substantially resonant with at least one resonant optical mode, the resonant optical mode being at least partially supported by the fiber-ring optical resonator, the fiber-ring optical resonator comprising a transverse resonator segment integral with a resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of at least one immediately adjacent segment of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and

modulating a coupling condition between the transmission optical waveguide and the fiber-ring optical resonator, thereby modulating the level of transmission through the transmission optical waveguide of the optical signal between a higher operational transmission level and a lower operational transmission level when the optical signal is substantially resonant with at least one resonant optical mode.

54. **(previously presented)** A method for altering transmission of an optical signal through a first transmission optical waveguide, comprising the steps of:

evanescently optically coupling a fiber-ring optical resonator to the first transmission optical waveguide, thereby altering transmission of the optical signal through the first transmission optical waveguide when the optical signal is substantially resonant with at least one resonant optical mode, the resonant optical mode being at least partially supported by the fiber-ring optical resonator, the fiber-ring optical resonator comprising a transverse resonator segment integral with a resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of at least one immediately adjacent segment of the resonator optical

fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment; and

optically coupling a second transmission optical waveguide to the fiber-ring optical resonator, thereby enabling transfer of the optical signal between the first transmission optical waveguide and the second transmission optical waveguide when the optical signal is substantially resonant with at least one resonant optical mode.

55. **(cancelled)**

56. **(cancelled)**

57. **(cancelled)**

58. **(cancelled)**

59. **(currently amended)** ~~The method of Claim 56,~~ A method for altering an optical resonance frequency of a fiber-ring optical resonator, comprising the step of altering a refractive index of the fiber-ring optical resonator until a desired optical resonance frequency is obtained, wherein the refractive index of the fiber-ring optical resonator is altered by UV-irradiation thereof.

60. **(currently amended)** ~~The method of Claim 58,~~ A method for altering optical resonance spectral properties of a coupled fiber-ring optical resonator assembly, comprising the step of altering at least one of a number of coupled fiber-ring optical resonators, a degree of optical coupling among the fiber-ring optical resonators, and optical resonance spectral properties of each of the plurality of fiber-ring optical resonators, wherein a refractive index of at least one of the number of coupled fiber-ring optical resonators is altered by UV-irradiation thereof.